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(54) **Concrete paving**

(57) A lattice frame comprising members (1, 2, 3, 4) of expanded polystyrene or like material which are bonded together at their ends is used in the construction of a concreted area. Bores or openings (5) may be provided in the intermediate members (3, 4).

The frame may be filled with concrete to form a composite slab or several may be laid and filled in situ. In both cases the frame is incorporated in the concrete.

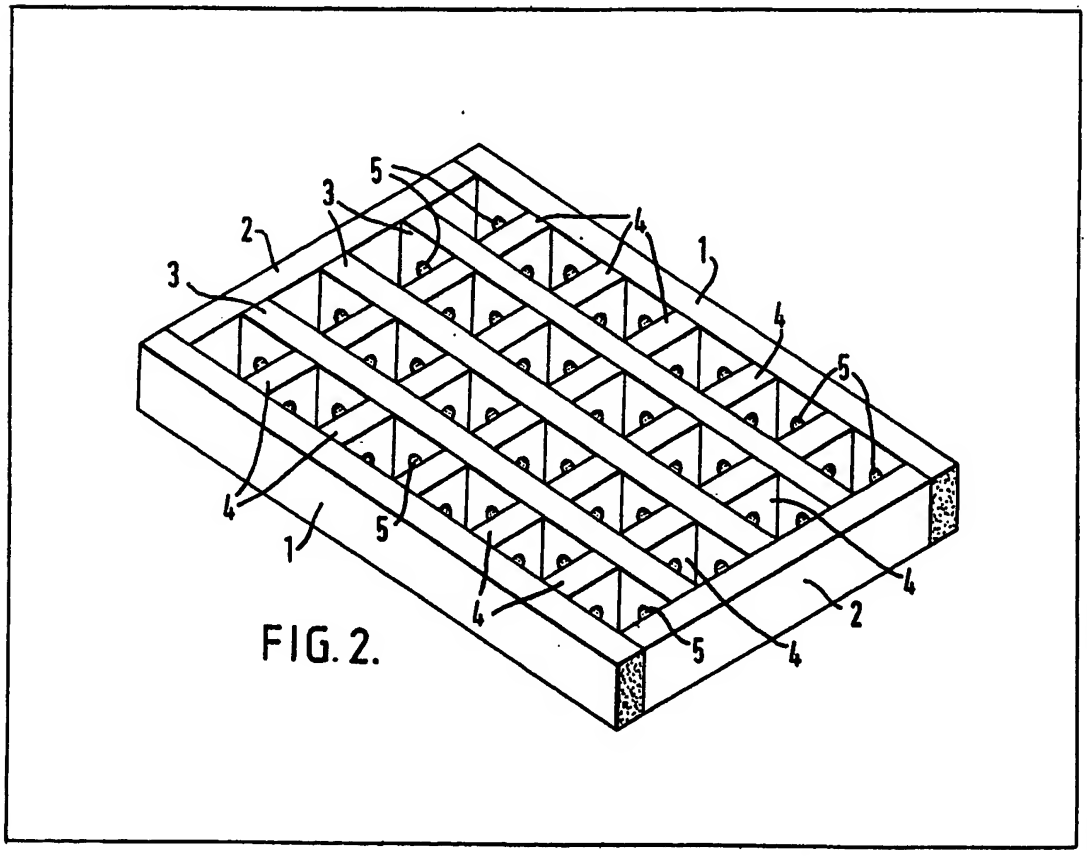

FIG. 2.

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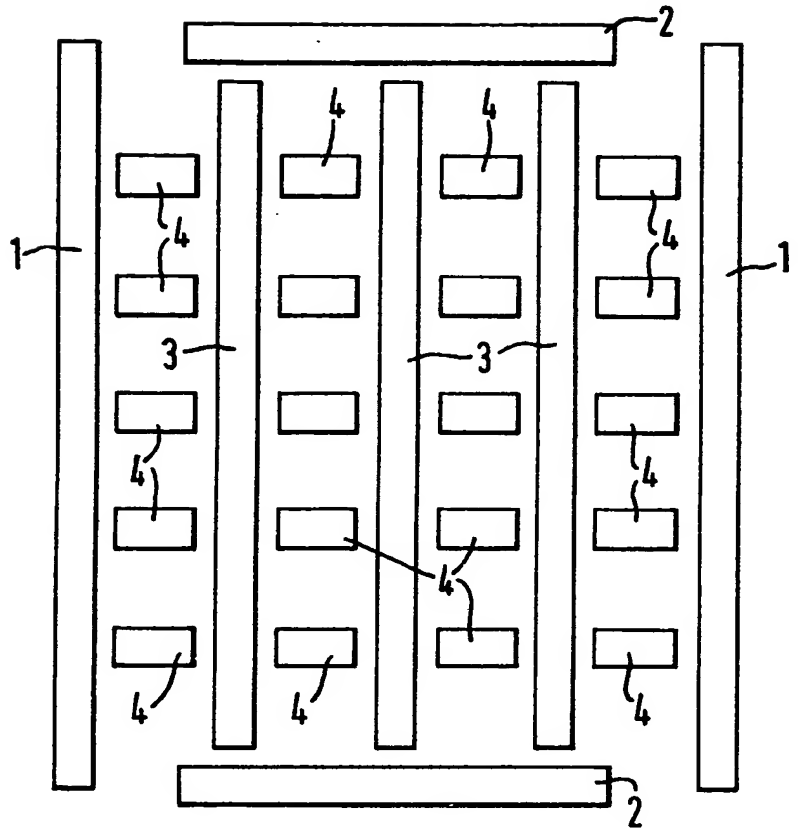


FIG. 1.

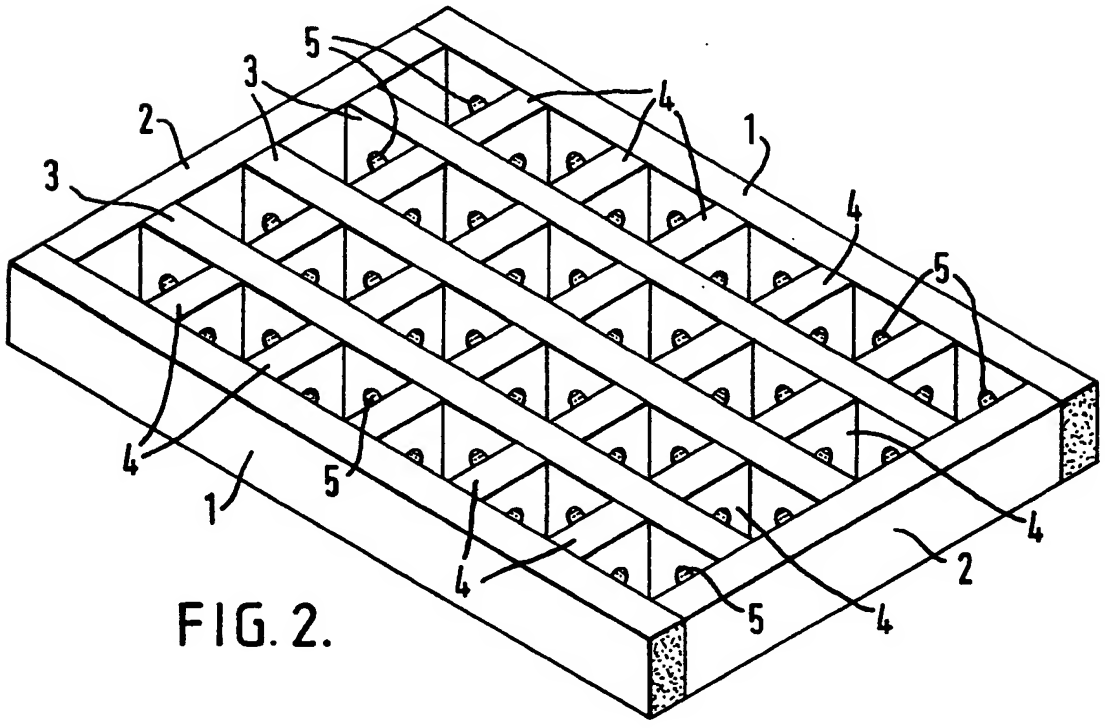


FIG. 2.

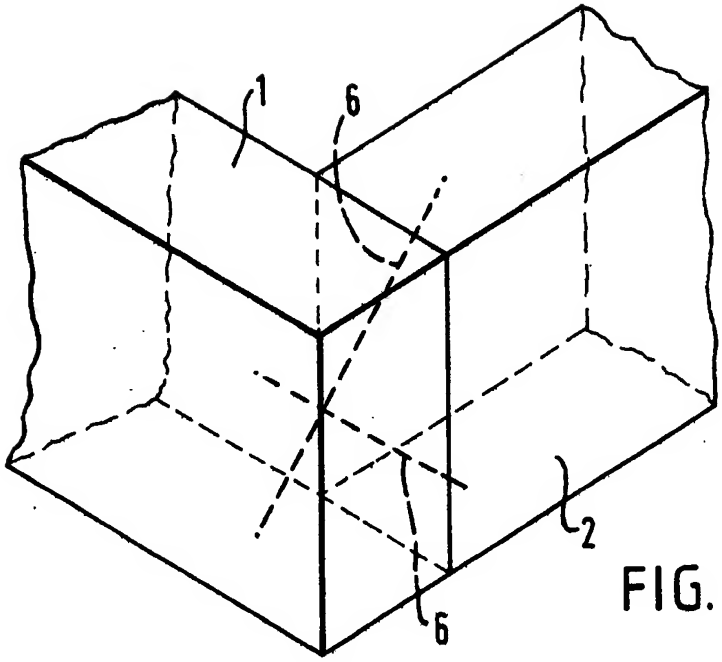
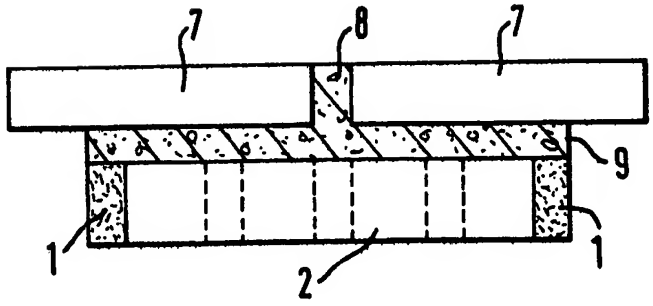


FIG. 3.

FIG. 4.



SPECIFICATION

Improvements in concrete construction

This invention relates to the construction of paths, patios and like areas and is particularly concerned with a frame for use in the construction of such areas.

Paths, patios and like areas are conventionally made from concrete by a method consisting of preparing an area to be concreted by excavation to a suitable depth and then laying hard core followed by a dry mix of cement and sand over the bottom of the excavation. Shuttering in the form of wooden planks or boards is constructed to form a framework defining the edges of the area to be concreted. Care must be taken that the upper edges of the shuttering are substantially level or follow a predetermined desired slope or incline because these edges of the shuttering will determine the upper surface of the concreted area. A concrete mix of cement and sand in the form of a slurry is then poured or otherwise applied to the hard core and built up until it is level with the upper edges of the shuttering. Care must be taken that the upper surface of the concrete mix is level and contains no holes or pockets nor upwardly projecting areas. The concrete is then allowed to set hard after which the shuttering can be knocked away to leave the concreted area.

The shuttering is usually destroyed or substantially damaged when it is knocked away and is rarely re-usable. Further, the area defined by the shuttering must be concreted in a single session thereby necessitating the use of a concrete mixer for large areas if the concreting is to be done in the time available. It is also necessary to use long lengths of shuttering for large areas which is expensive.

The present invention aims to provide means for facilitating the formation of paths, patios and like areas which avoids the disadvantages encountered by the conventional method of construction.

According to one aspect of the invention, there is provided a method of constructing a path, patio or like area which includes the step of making a frame from strips of polystyrene or like synthetic material, the outer dimensions of said frame corresponding substantially to those of the desired area of path, patio or the like and the frame consisting of a latticework of sections or strips extending between the sides defining said outer dimensions of the frame, said frame being positioned at said area and being adjusted to be substantially level or to have a desired slope or incline and concrete being poured or otherwise applied to occupy the spaces between the lattices of the frame, the concrete being made level with the upper edges of the frame and allowed to set hard whereby said frame is incorporated into the concreted area of path, patio or the like.

Another aspect of the invention provides a frame for use in the construction of a concreted path, patio or like area, which frame comprises a plurality of strips of polystyrene or like material and is arranged to have outer sides corresponding substantially to the dimensions of an area which is to be concreted and intermediate members extending in lattice fashion between said outer sides, the spaces between said intermediate members and outer sides being adapted to receive concrete whereby the frame is incorporated into said concreted area.

Alternatively, a path, patio or like area may be constructed from a series of slabs each made from a frame consisting of a plurality of strips of polystyrene or like material having outer sides corresponding to the desired size of a slab and intermediate members extending in lattice fashion between said outer sides, the spaces between said intermediate members and outer sides being filled with concrete which is allowed to set to form a composite slab consisting of said strips of polystyrene or like material and concrete.

The frame is preferably constructed from a series of strips of polystyrene or like material which are cut to desired lengths and fixed together at their ends with a water-based plastics filler. The fixing points are desirably reinforced, particularly at the corners of the frame, by means of one or more fixing pins. The pins are preferably oval in cross-section and extend diagonally to the plane of the joint between the strips. A wooden frame may be used to construct the frame of polystyrene or like material strips if desired. After the plastics filler has set, which usually takes about an hour, the frame can be laid on the area to be concreted. If, on the other hand, the frame is required for the construction of a slab, the spaces between the strips may simply be filled with concrete which is allowed to set after which the slab is ready for use.

The invention will now be further described, by way of example, with reference to the drawings, in which:—

Fig. 1 is a plan view of one embodiment of a frame according to the invention showing the strips arranged ready for fixing together to form said frame;

Fig. 2 is a schematic perspective view of a frame assembled from the strips in Fig. 1;

Fig. 3 is a detailed view, to an enlarged scale, showing the manner in which the corners of the frame are joined together; and

Fig. 4 is an end elevation of a paved path using a frame according to the invention.

Referring to the drawings, a frame for use in the construction of a path, patio or like area according to the invention is assembled from a plurality of strips of polystyrene or like material. As shown in Fig. 1, the frame consists of a pair of outer side members 1 and a pair of outer end members 2 together with a number of intermediate members 3 which are arranged to extend parallel to the side members 1 and a number of intermediate members 4 arranged between the side members 1 and intermediate members 3 and extending parallel to the end members 4.

The ends of the end members 2 are joined to the ends of the side members 1 and the ends of the intermediate members 3 are joined to the end

members 2 interm diate th ir ends. The ends of the intermediate members 4 are joined to the side members 1 and intermediate members 3 intermediate their ends to form the lattice structure shown in Fig. 2. The joints are achieved by the use of a water-based plastics filler which is applied to the ends of the strips after which the ends are pressed against the side of the member to which they are to be joined and the plastics filler is allowed to set. As also shown in Fig. 2, the intermediate members 3 and 4 may each be provided with one or more through going bores or openings 5 to permit concrete to pass between adjacent spaces defined by the intermediate members whereby said members may be more firmly bonded into the concrete.

As shown in Fig. 3, the joints at the corners of the frame, at which the side members 1 are joined to the end members 2, are preferably reinforced by a pair of pins 6 which extend diagonally to the end plane of the joint between the members 1 and 2. These pins serve to reinforce the joints and provide a more rigid construction of the frame. The joints of the intermediate members 3 and 4 may also be reinforced by like pins if desired. The pins are desirably oval in cross-section and are made of steel.

Once the frame has been constructed and the plastics filler has set hard, the frame may be used in one or two ways. Either the spaces in the frame may be filled with concrete up to the upper edges of the strips and the concrete allowed to set hard to form a slab or the frame may be laid down on an area which it is desired to concrete in order to form a path or patio or the like. In the latter case, the frame must be carefully positioned to ensure that it is substantially level or has a desired slope or incline after which concrete may be poured or otherwise applied to the spaces between the frame and filled level with the upper edges of the strips of said frame.

The concrete may be applied as a dry mix of sand and cement which is packed into the spaces between the strips. The frame with the filled spaces may then be sprayed with water by suitable means, such as a watering can fitted with a rose, to dampen the mix. Alternatively, the concrete may be applied as a slurry consisting of a mixture of cement, sand and water. Ballast may be used in addition or as an alternative to sand. The concrete may also include broken chips of polystyrene or like material of an aggregate size no greater than 20 mm which is mixed with cement and water to form a workable concrete slurry. This mixture may replace sand and/or ballast or may be used in addition to these materials.

Fig. 4 shows another use of a frame made acc rding to the inv ntion. In this case slabs 7 are applied to a path which has pr viously b en made with fram s consisting of strips f polystyrene or like material using the above-described method according to the invention. The slabs 7 should extend beyond the dges of the fram as shown in Fig. 4 to allow a cement and sand finish to b rend red. Similarly, a gap 8 should b left between adjac nt slabs 7 f r pointing.

Only two slabs are illustrated in Fig. 4 but it will be appr ciated that any numb r of slabs may be laid on one or more frames according to the invention. The slabs are laid by applying a slurry 9 of concrete to a previously laid frame and then laying a slab onto the slurry and levelling the slab in a conventional manner.

By means of the frames according to the invention, it is possible to concrete a desired area in stages so that the area does not have to be concreted all at the same time and the work may be spread over a number of days. Thus, it is not necessary to use a cement mixer but the concrete can be hand-mixed in small amounts as required. This will be of particular attraction to the independent contractor or do-it-yourself enthusiast who need only mix one bag of cement at a time. The laying around of bulk materials can thus also be avoided.

When applying slabs, it is only necessary to ensure that at least one frame is left unslabbed at the end of a working day to ensure that the level for further frames can be maintained.

The frames according to the invention are preferably made from strips cut from expanded polystyrene sheets which material is rot-proof, durable and moisture-resistant. The use of such frames represents a saving on labour costs, materials, water and time.

CLAIMS

1. A method of constructing a path, patio or like area which includes the step of making a frame from strips of polystyrene or like synthetic material, the outer dimensions of said frame corresponding substantially to those of the desired area of path, patio or the like and the frame consisting of a latticework of sections or strips extending between the sides defining said outer dimensions of the frame, said frame being positioned at said area and being adjusted to be substantially level or to have a desired slope or incline and concrete being poured or otherwise applied to occupy the spaces between the lattices of the frame, the concrete being made level with the upper edges of the frame and allowed to set hard whereby said frame is incorporated into the concreted area of path, patio or the like.

2. A method of constructing a path, patio or like area from a series of slabs each of which is made from a frame consisting of a plurality of strips of polystyrene or like material having outer sides corresponding to the desired size of a slab and intermediate members extending in lattice fashion between said outer sides, the spaces between said interm diat members and outer sides being filled with concret which is allowed to set to form a composite slab consisting of said strips of polystyrene or lik material and concrete.

3. A frame for use in th construction of a concr ted path, patio or like ar a, which frame comprises a plurality of strips of polystyren or like

material and is arranged to have outer sid s corresponding substantially to the dim nsions of an area which is to be concreted and intermediate members extending in lattice fashion between said outer sides, the spaces between said intermediate members and outer sides being adapted to receive concrete whereby the frame is incorporated into said concreted area.

4. A frame according to claim 3, wherein said frame is constructed from a series of strips of polystyrene or like material which are cut to desired lengths and fixed together at their ends.

5. A frame according to claim 4, wherein the strips are fixed together at their ends with a water-based plastics filler.

6. A frame according to claim 4 or claim 5, wherein the fixing points of said strips are reinforced, at least at the corners of the frame by means of one or more fixing pins.

7. A frame according to claim 6, wherein the fixing pins are oval in cross-section and extend diag nally t the plane of the joint between the strips.

8. A frame according to any one of claims 3 to 7, wherein the frame is substantially rectangular and wherein each of the intermediate members extends substantially parallel to a respective one of the pairs of opposite sides of the frame.

9. A frame according to any one of claims 3 to 8, wherein each of the intermediate members is provided with one or more through-going bores or openings to permit concrete to pass between adjacent spaces defined by the intermediate members.

10. A method of constructing a path, patio or like area substantially as described herein with reference to the drawings.

11. A frame for use in the construction of a concreted path, patio or like area substantially as described herein with reference to the drawings.

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